

How Arizona Uses  
the Water Quality  
Portal to Save Time  
and Money

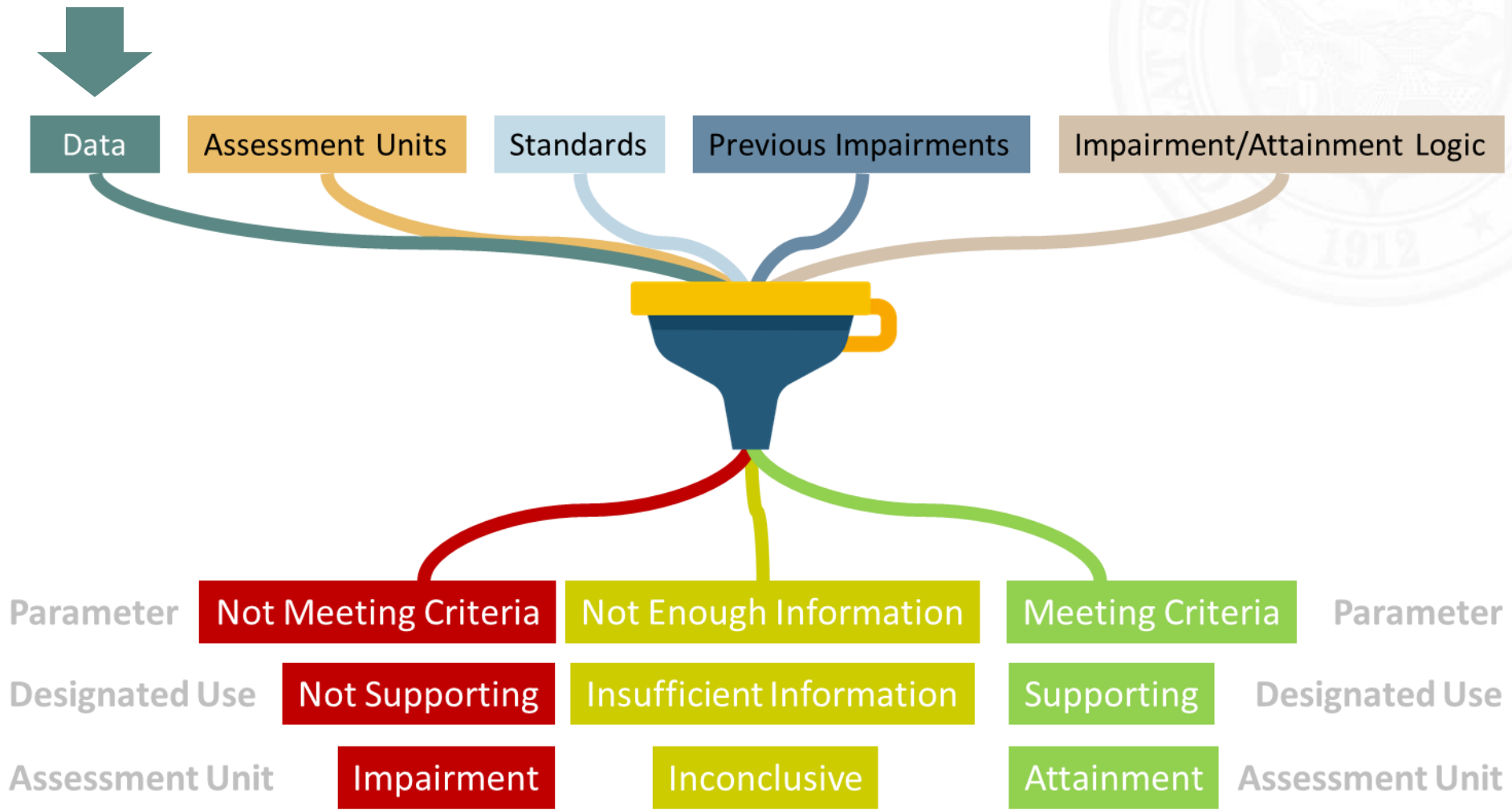


May 28, 2020  
Jason D. Jones

- Virtual hello
- Goal = Show you the **pluses** and **minuses** of the portal



# Road Map



# Assessments From Months to Minutes

Old Way



External Data

1. Gather (3 months)



AZDEQ Database

2. Format (6 months)



3. Assess (4 months)



ID	Name	Water Type	Size	Units	Status
AZ1007102-580A_00	NEW RIVER - NWIR - 9 - MG - MG - 1907102	STREAM	231	Miles	Active
AZ1000001-580_00	Cox Gulch, Run Headwaters to THREE R CANYON	STREAM	2.2	Miles	Active
AZ1000001-070A_00	Little Colorado West Fork, Run Headwaters to GOVERNMENT SPG	STREAM	9.075	Miles	Active
AZ1000001A-1200_00	Saguaro Lake	LAKE FRESHWATER	1002	Acres	Active
AZ1000001A-580_00	FISH CREEK/LOWER SALT RIVER BASIN - FISH - 9 - BR - BR - 1000001A	STREAM	136	Miles	Active

4. Send to ATAINS

Touch Time = 13 months

New Way



Various Databases

1. Gather (7 minutes)



Portal

2. Format (0 minutes)



3. Assess (5 minutes)

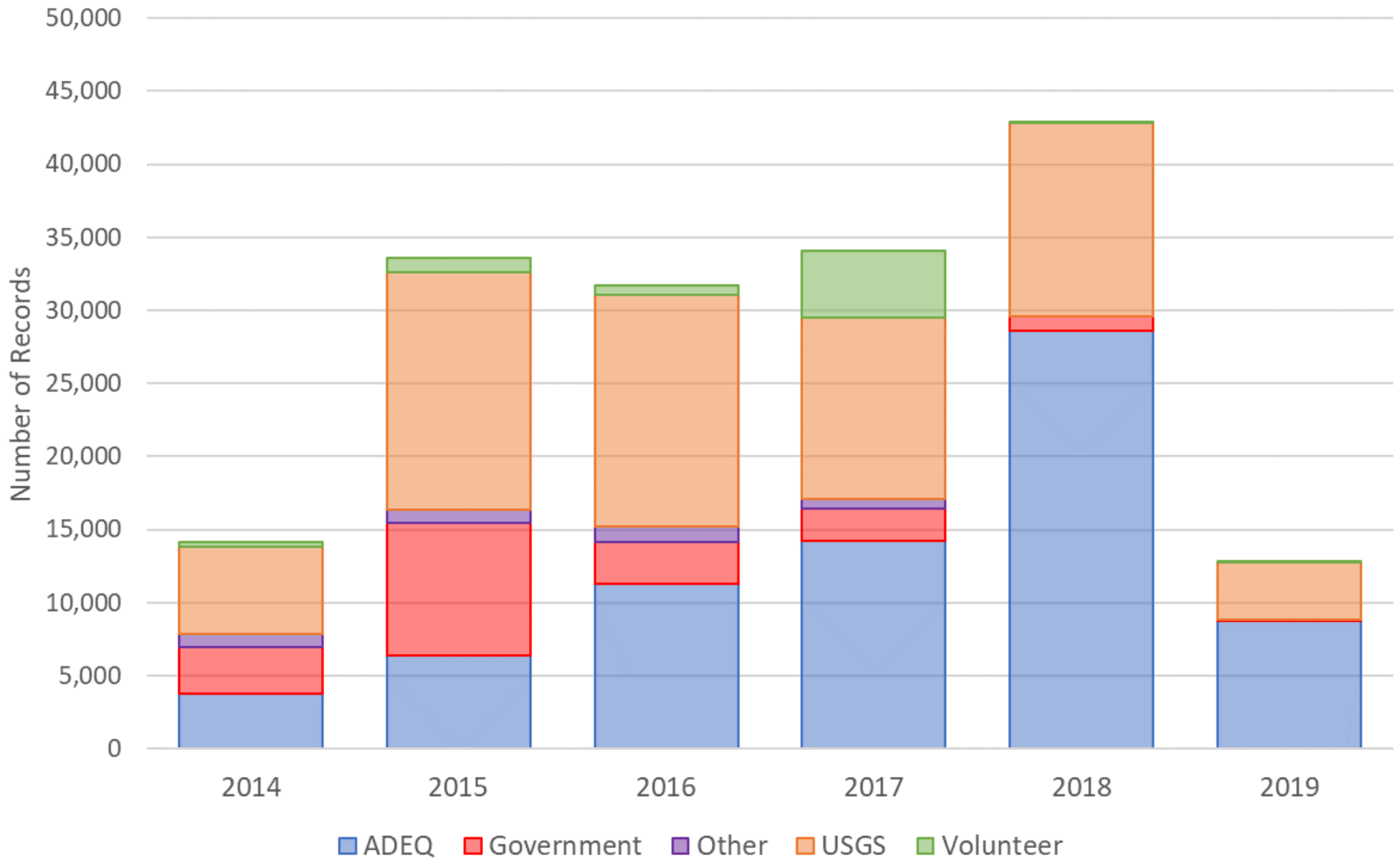


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4. Send to ATAINS

Touch Time = 12 minutes!

# Data Used in the 2020 Assessment



- **Less formatting** because data already in a common schema.
- **Less maintenance** of other agencies data (1 FTE)
- **Free infrastructure!**
- Web services make it **easy to import data** into R or other programs



- You don't have control.
  - Very **rarely** data by other agencies is removed...problem if that is the data you're using to make impairment decision
  - About **70% of USGS data is missing detection limits** due to a mapping issue between NWIS and the portal.
- **Pluses** outweigh **minuses**



# Real Time Assessments

RStudio

Project: (None)

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function Addins

Real Time Assessment 2022.R c.sites boulderdata Untitled3\* ATTAINSPARAMETERS ZATI

```
1 ##### ARIZONA's Real Time Assessment Tool - "Ratatoole" #####
2 #### Code by Jason Jones, Arizona Department of Environmental Quality, October 2018
3 #### Code is free to use and distribute. Proper credit is requested.
4 #### Contact. Jason Jones, Arizona Assessment Coordinator, jdj@azdeq.gov, 602-771-2
5
6 #### Purpose: To pull data from WQX, compare it to standards and determine assessmen
7
8
9
10 ##### A - ESTABLISH LIVE CONNECTION WITH WATER QUALITY PORTAL AND GET RAW DATA #####
11
12
13
14 # Clock how long it takes code to run...end time is at the end of the code
15 start_time <- Sys.time()
16
17 # Load packages - install package if not already installed
18 library(tidyverse)
19 library(lubridate)
20 library(RODBC)
21
22 # Turn off scientific notation
23 options(scipen = 999)
24
25 # Set up directory
26 catwd("C:/Users/65942/Desktop/rt_a_20200508")
27
```

3784:1 # TEMP FISH R Script

Console Terminal Jobs

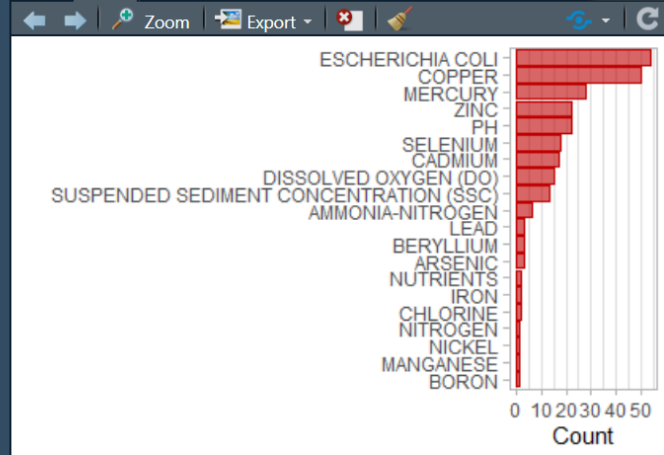
```
C:/Users/65942/Desktop/wqdb vs wqx/
+ ggplot(aes(x = ActivityStartDate, y = ResultMeasureValue, color = CharacteristicName))
+
+ geom_point() +
+ # geom_line() +
+ scale_y_log10()
warning message:
Removed 115 rows containing missing values (geom_point).
>
```

Environment History Connections

Global Environment

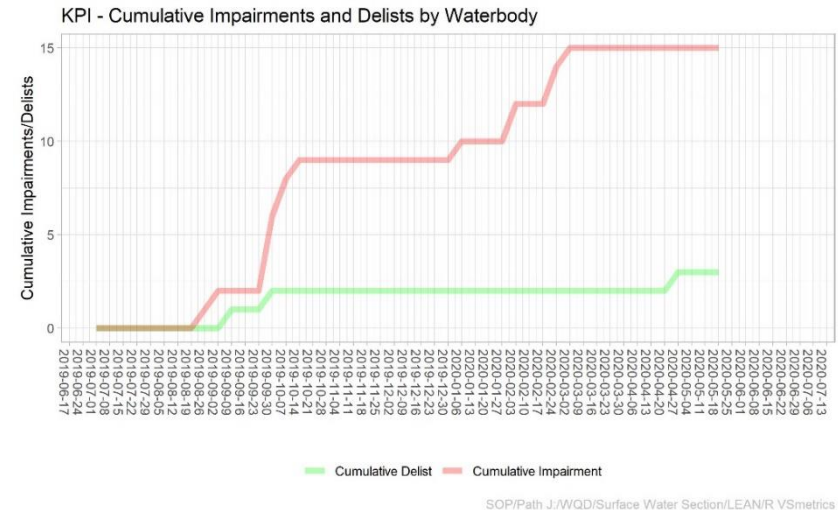
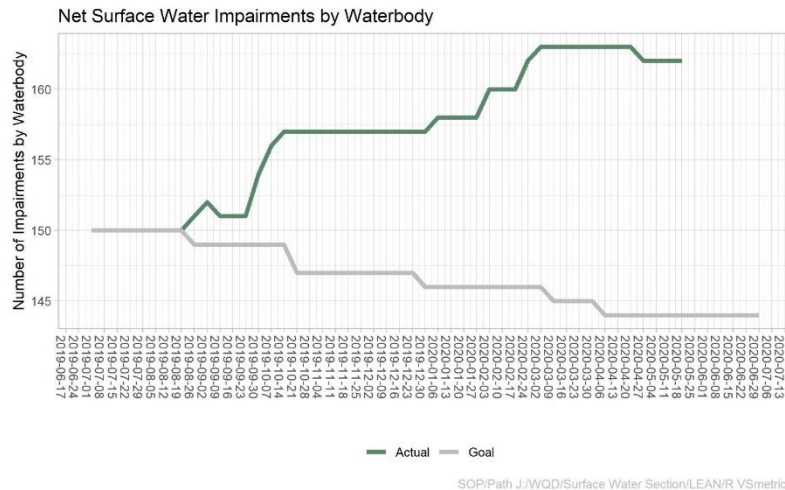
Variable	Observations	Variables
a.azsites	2918 obs.	36 variables
a.azstream	182108 obs.	31 variables
a.usgs	17239 obs.	31 variables
ATTAINS2018...	142 obs.	6 variables
ATTAINS2020...	32 obs.	7 variables
ATTAINS2020...	32 obs.	38 variables
ATTAINS2020...	32 obs.	4 variables
ATTAINS2020...	1774 obs.	20 variables
ATTAINS2020...	32 obs.	4 variables
ATTAINSPARA...	15118 obs.	8 variables
b.azdata	199278 obs.	31 variables
b.azsites	2918 obs.	36 variables
b.ph	11058 obs.	31 variables
boulderdata	3748 obs.	63 variables
boulderdata2	List of 9	

Files Plots Packages Help Viewer





## Arizona does **weekly** assessments



1



**Automated Decision.**  
Solely based on data.

2



**Provisional Decision.**  
Human can override computer.

3



**Official Decision.**  
Send to EPA's ATTAINS.

- Adaptive sample plans **saved \$300,000** in lab budget for FY20 while making **more decisions**
- Current data used to develop sampling plans
- Spreads out the work
- No surprises
- Can see if waterbody **improvements** are working



What it feels like to use old data to develop a sample plan.





**Questions?**

**Jason Jones**

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**602-771-2235**

**Real Time Assessment R Code**

**<https://github.com/ghroyd1110/WaterAssessmentCalculator>**